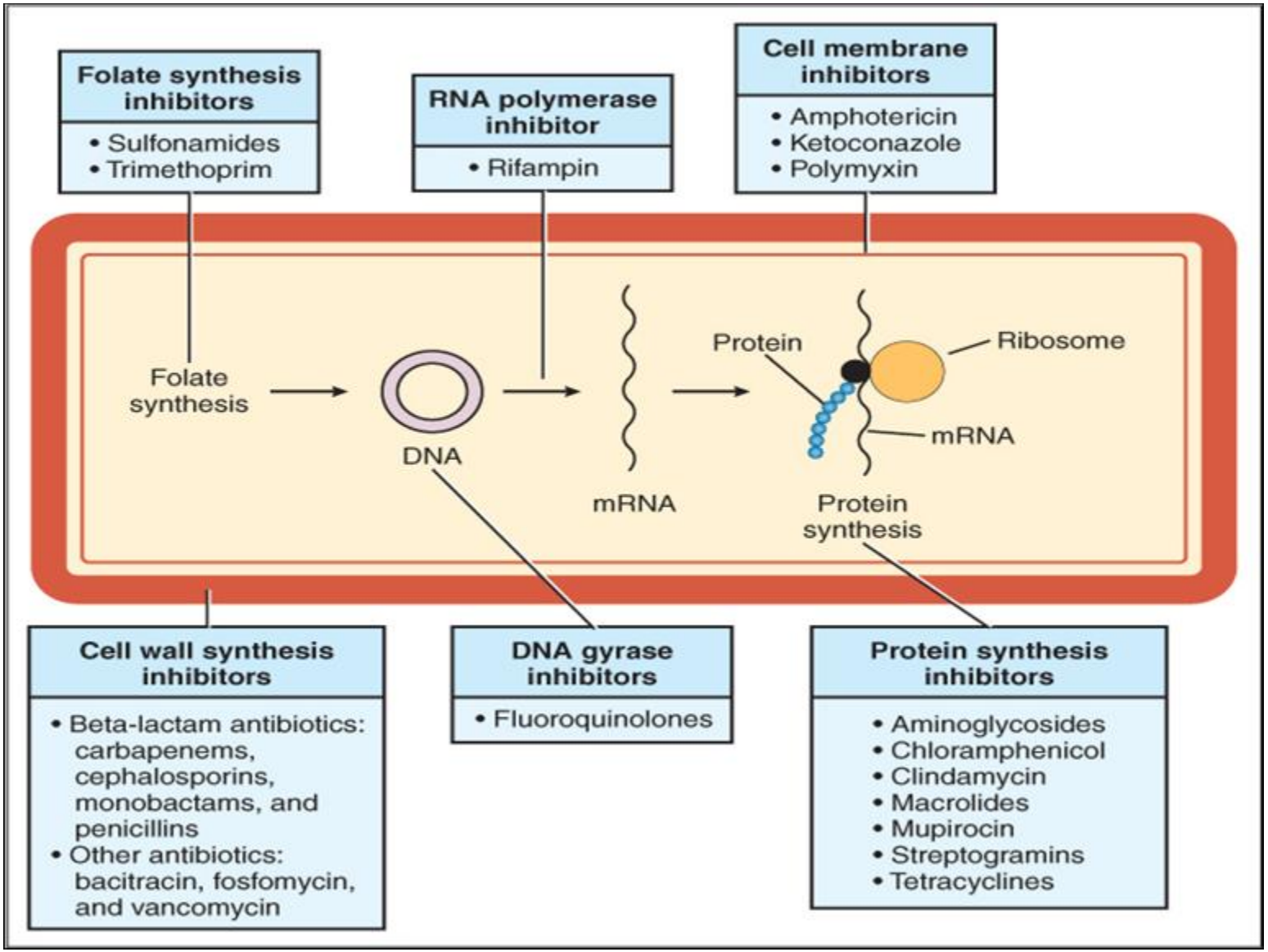

Brenner and Stevens, Pharmacology 3rd edition, page 413, copyright © 2010

Mechanism of Action	Antimicrobial Agents
Inhibition of bacterial cell-wall synthesis	Penicillins, cephalosporins, imipenem/meropenem, aztreonam, vancomycin
Inhibition of bacterial protein synthesis	Aminoglycosides, chloramphenicol, macrolides, tetracyclines, streptogramins, linezolid
DNA topoisomerase II (DNA gyrase) and IV inhibitors	Fluoroquinolones
Inhibition of nucleic acid synthesis	Rifampin
Inhibition of folic acid synthesis	Sulfonamides, trimethoprim, pyrimethamine (Txs. toxoplasmosis)
Disruption of cell membrane function	Azole and polyene antifungal agents

Antimicrobial Agents	Primary Mechanisms of Resistance
Penicillins and Cephalosporins	Production of beta-lactamases, which cleave the beta-lactam ring structure; change in penicillin-binding proteins; change in porins
Aminoglycosides (gentamicin, streptomycin, amikacin, etc.)	Formation of enzymes that inactivate drugs via conjugation reactions that transfer acetyl, phosphoryl, or adenylyl groups
Macrolides (erythromycin, azithromycin, clarithromycin, etc.) and clindamycin	Formation of methyltransferases that alter drug binding sites on the 50S ribosomal unit

Antimicrobial Agents	Mechanisms of Resistance
Tetracyclines	Increased activity of transport systems that "pump" drugs out of the cell
Sulfonamides	Change in sensitivity to inhibition of target enzyme; increased formation of PABA; use of exogenous folic acid
Fluoroquinolones	Change in sensitivity to inhibition of target enzymes; increased activity of transport systems that promote drug efflux
Chloramphenicol	Formation of inactivating acetyltransferases

A 37-week gestation infant male presents with respiratory distress. Six hours after a normal vaginal delivery the infant had slightly increased body temperature, and displayed jaundice and lethargy. In order to provide effective coverage for suspected bacterial meningitis, what would be the most appropriate empiric therapy?

A. Nafcillin + cephalexin
B. Ampicillin + cefotaxime
C. Penicillin G + gentamicin
D. Ceftriaxone
E. Vancomycin

Causative organisms = Strep pneumo, N. meningitidis, H. influenza
Typical empiric meningitis therapy =3rd-gen cephs
Causative organisms in neonates =Group B Strep, E. coli, Listeria
Correct Answer: B